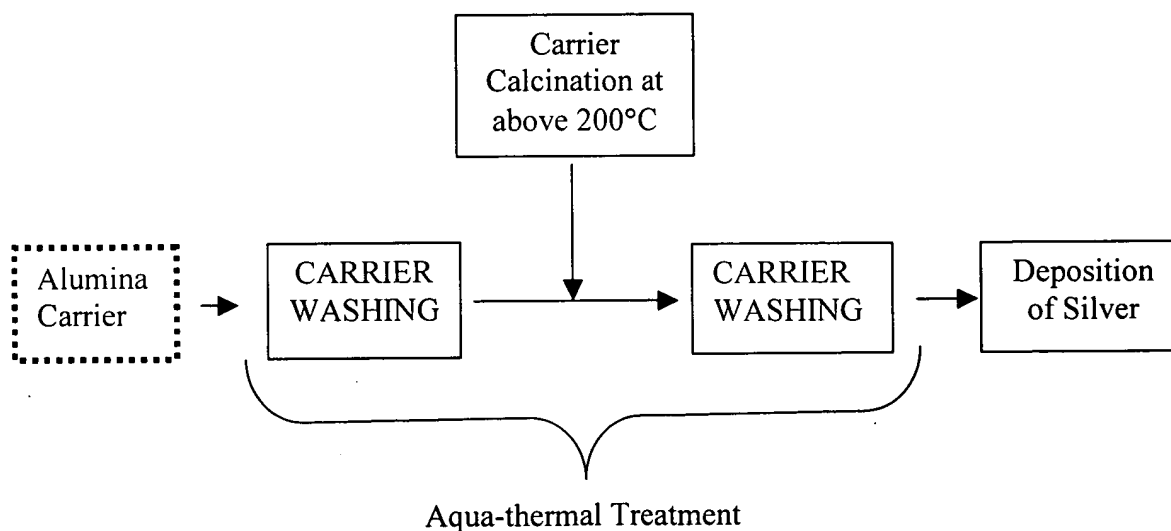


## REMARKS

The examiner has rejected claims 1-4 and 6-15 under 35 U.S.C. 103 over Takada in view of Jin. Applicants urge that this rejection is not well taken.

The present claims relate to a process for preparing a catalyst for the production of ethylene oxide. In this process where silver is to be supported on an alumina carrier, the carrier is subjected to aqua-thermal treatment prior to deposition of silver. The aqua-thermal treatment comprises a *sequential series of at least two carrier washings with intermediate carrier calcination at a temperature above 200°C*. This particular combination of steps is not shown or suggested in the applied art, and the examples of the application show the *unexpected improvement* achieved by this combination. It is further urged that the cited art fails to show the resulting carrier prepared by this process, and the resulting catalyst formed by the claimed treatment.

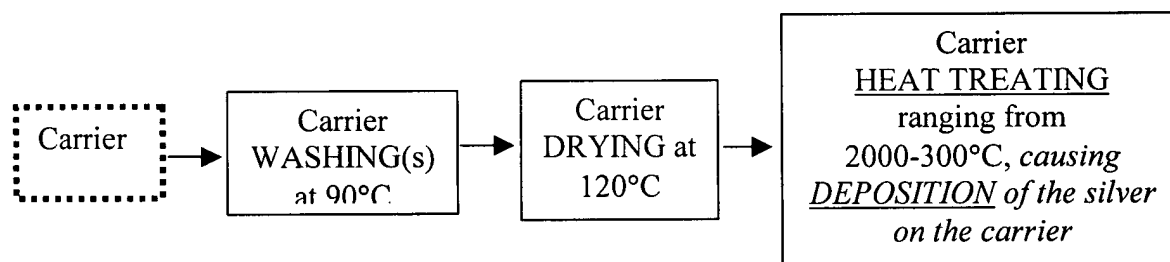
The present invention can be visualized according to this process timeline:



Regarding Takada, it is urged that the teachings of this reference fail to obviate the present invention. Takada teaches a procedure wherein their carrier is washed with water at 90°C, is then dried at 120°C, and then is deposited with a silver salt solution. A key feature of the present

invention is that *prior to deposition of silver*, the carrier is washed, then calcined at above 200°C, and then washed again. While the examiner urges that Takada mentions multiple washing steps, it is urged that *nowhere* in Takada is it taught to conduct a calcination step at above 200°C in between two washing steps, as required by the present claims. In a telephone interview on May 10, 2005 the Examiner expressed to Applicants that Takada discloses a high heating temperature in column 4, on lines 50-55. Applicants respectfully point out that this high heating temperature is discussed as a drying step which *causes the deposition of metallic silver* on the carrier. In contrast, Applicants require a *washing step* after the calcination step but prior to deposition of silver. It is urged that this required washing step of the present invention would not be possible according to Takada, since their high heat treatment discussed column 4, lines 50-55, *causes* the deposition of silver and therefore must be *simultaneous* with the deposition of silver.

This embodiment of Takada can be visualized as follows:



Since Takada's high heat treating step is *simultaneous* with the deposition of silver, it is urged that no additional washing step could take place between the high heating and silver deposition.

Takada et al. may also include a heating of their the catalyst *after* deposition of the silver. Applicants urge that this is in no sense anticipatory of the present claims, since the present invention requires a calcination *prior* to the deposition of silver. Furthermore, Takada teaches that their heating of the silver containing catalyst serves to *remove organics and convert catalyst components to an active form*, neither of which concept is relevant to the carrier wash and calcination sequence of the invention. In contrast, as stated in the present specification on page 2 lines 14-22, the high heat calcination of the present invention unexpectedly serves to improve catalyst stability, which can improve selectivity stability 30-fold. For the above stated reasons,

Applicants urge that Takada fails to teach the claimed treatment procedure, and thereby fails to achieve the improved results of the present invention.

The examiner previously conceded that Takada fails to disclose multiple washing and calcinating steps, as well as calcinating of the carrier at temperatures above 200°C, as required by the present invention. In an attempt to fill this void, the examiner has cited Jin for disclosing a heating of their carrier from 1450-1550°C.

The examiner takes the position that it would have been “prima facie obvious” to one of ordinary skill in the art to have calcined a carrier at the temperatures disclosed in Jin, because “it is known to do so”. Applicants disagree for several reasons. First, it is urged that the examiner is merely selecting and combining features from references where there is no suggestion in those references to do so. “Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.” In re Geiger, 2 U.S.P.Q.2d 1276, 1278 (CAFC 1987). Applicants submit that there is no teaching or suggestion anywhere in either reference which offers any motivation for one skilled in the art to combine the teachings of Takada with the temperature ranges of Jin. There is no showing in either reference that would inspire one to believe that heating the carrier to such temperatures would or should be successful in formulating the presently claimed invention.

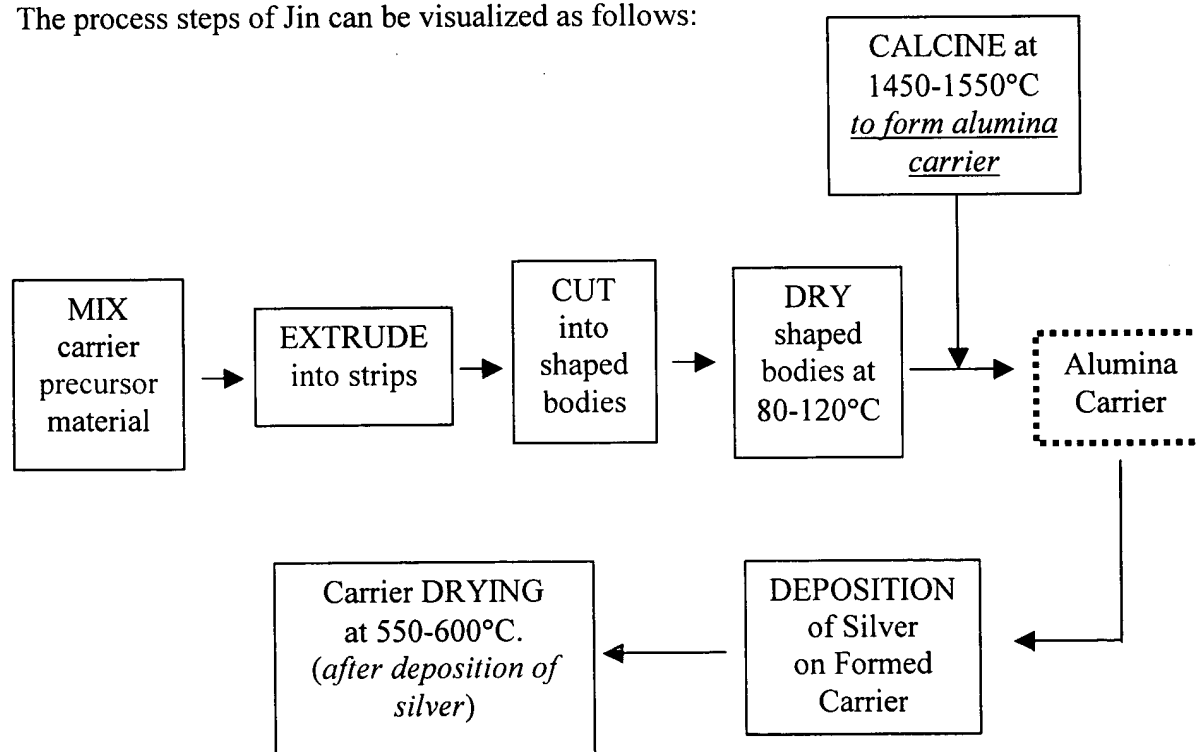
Furthermore, it is urged that a hypothetical combination of Takada and Jin would still fail to obviate the present claims. Applicants urge that, like Takada, the Jin reference also fails to suggest the wash — calcine — wash sequence which is a key feature of the presently claimed invention. It is submitted Jin fails to teach or suggest the carrier *washing* steps as required by the present claims. In addition, while the examiner then specifically cites Jin for teaching the presently required calcinations steps, Applicants strongly urge that such is not taught by Jin.

Indeed Jin teaches a high temperature heating step ranging from 1450-1550°C. However, this step is conducted in a process step *earlier* than that required by the present claims. Specifically, Jin teaches a high temperature heating during a process for forming the alumina carrier itself.

According to Jin's process, various carrier precursor materials are mixed and kneaded into an extrudable paste. The paste is then extruded into strips and cut into shaped bodies, which are then dried at 80-120°C. These dried shaped bodies are *then calcined* at a temperature of from 1450-1550°C *to thereby form an alumina carrier*. Applicants urge that prior to this step disclosed on column 1, line 67 through column 2 line 2, an alumina carrier does not yet exist. In contrast to Jin, the present invention teaches a calcination of an already formed alumina carrier, wherein such calcination is conducted *between washing steps*. Such is clearly not taught by Jin.

Once formed, the alumina carrier of Jin is impregnated with silver and dried. While this drying is indeed conducted at a temperature in the range of 550-600°C (above 200°C), Applicants wish to point out that this high temperature drying is conducted *after* the deposition of silver. In contrast, the calcination of the present invention is conducted *prior* to the deposition of silver. Thus, the high temperature drying of Jin *should not be* considered analogous to Applicant's required calcination step.

The process steps of Jin can be visualized as follows:



It is urged that since both references fail to disclose key features of the present invention, one skilled in the art would not be inspired to formulate the present invention upon a combined reading of Takada and Jin. For the above reasons, Applicants respectfully urge that the present claims are not obviated, and request that the 35 U.S.C. 103 rejection be withdrawn.

The examiner has rejected claims 12-13 under 35 U.S.C. 103 over Takada in view of Mross. Applicants respectfully urge that this ground of rejection is not well taken.

The arguments against Takada are repeated from above and apply equally here. In particular, Takada fails to disclose key features of the present claims, including multiple washing and calcinating steps, and calcinating of the carrier at temperatures above about 200°C, as required by the present invention. In an attempt to fill this void, the examiner cites Mross for teaching a washing of the carrier with aqueous solutions of carboxylic acids and alkaline earth metal salts.

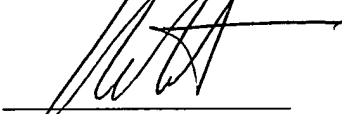
Indeed Mross relates generally to the formation of ethylene oxide. However, it is submitted that there is *no* teaching or suggestion in either of Takada or Mross which would lead one skilled in the art to combine these references in an effort to devise the presently claimed invention. It is again urged that the examiner is merely selecting and combining features from references where there is no suggestion in those references to do so.

While Mross does disclose the washing of a carrier material with aqueous solutions which may include carboxylic acids and alkaline earth metal salts, it does not teach or suggest anything which would inspire one skilled in the art to do so in the context of the present claims or the invention of Takada. The Examiner appears to be going to great lengths to locate and try to interrelate references involving ethylene oxide formation, but no matter how one applies or combines these references they do not teach using the specific sequence of steps in the claimed invention to attain the demonstrated benefits. The invention cannot be deemed unpatentable merely because, in a hindsight attempt to reconstruct the invention, one can find elements of it in the art; it must be shown that the invention as a whole was obvious at the time the invention was made without knowledge of the claimed invention. 35 U.S.C. 103.

It is further submitted that the combination of Takada and Mross would still fail to obviate the present claims. The combination of these references still does not teach the present claimed invention. The examiner incorrectly assumes that it would be obvious to one of ordinary skill to insert a calcination step at above 200°C between multiple washing steps of Takada. It is submitted that one skilled in the art would not be inspired to formulate the present invention upon a combined reading of Takada and Mross since both references fail to disclose key features of the present invention. Applicants therefore respectfully request that the 35 U.S.C. 103 rejection be withdrawn.

The undersigned respectfully requests re-examination of this application and believes it is now in condition for allowance. Such action is requested. If the examiner believes there is any matter which prevents allowance of the present application, it is requested that the undersigned be contacted to arrange for an interview which may expedite prosecution.

Respectfully submitted,



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Date: June 1, 2005